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Fly Control in Ohio Barns--II

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Wooster, Ohio

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Fly Control in Ohio Barns—II[1]

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INTRODUCTION

Resistance of fly strains to recommended insecticides is a constant threat. Therefore, the performance of insecticides for the control of flies in dairy barns is monitored regularly. To find replacements for insecticides which may become unavailable or ineffective, promising new compounds are evaluated.

The house fly, *Musca domestica* L., is the primary pest in Ohio barns during early summer. House fly resistance to several insecticides has been confirmed in the laboratory, and detailed information will be published elsewhere. The stable fly, *Stomoxys calcitrans* (L.), is a late summer pest, both in the barn and in the field. The research described here concerns control of both species, since no effort was made to differentiate these two species when making observations on control. This research is a continuation of the study reported previously (1) and was conducted during 1968-1971.

This publication is neither a recommendation nor an endorsement of any products mentioned. For current recommendations, consult the Ohio Cooperative Extension Service.

MATERIALS AND TREATMENT METHODS

This research was conducted in barns in Wayne and Holmes counties. All were dairy facilities, except one barn which housed cattle, horses, and swine and a second barn which housed swine. Most of the dairy barns were of the stanchion type. Some animals were housed in the barns much of the time. This often created sanitation problems, as calf and bull pens were not cleaned regularly of accumulated straw and manure.

The barns represented a wide range of management practices. None of the herds consisted of more than 50 lactating animals. Most barns were whitened regularly, most commonly with Carbola or other non-alkaline materials. Wall surfaces ranged from wood to stone, cinder block, and tile.

All treatments were applied at 90 psi with a Myers hydraulic sprayer. A single nozzle gun was used to wet all surfaces to runoff. Volume

[1]The cooperation of many dairy farmers in Wayne and Holmes counties is gratefully acknowledged.

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of spray ranged upward to 70 gallons per barn, depending on the area to be covered. Loafing areas of barns were usually sprayed with additional insecticide. Straw and manure accumulations were not treated. Special precautions were taken not to contaminate feed or watering devices. All animals were removed from barns during and for several hours after treatment.

The following insecticide formulations were used in sprays:

Baygon—0-isopropoxyphenyl methylcarbamate (70% WP)
Bromophos—(EL-400) (4 lb./gallon EC)
Iodofenphos—(CIBA C-9491) (50% WP)
Iodofenphos—(CIBA C-9491) (3 lb./gallon EC)
Cygon 267 (2.67 lb. dimethoate/gallon EC)
Cygon Systemic V (23.4% dimethoate, 2.5% dichlorvos EC)
Cygon WP (50% dimethoate)
Diazinon AG500 (4 lb./gallon EC)
Baytex EC (4 lb. fenthion/gallon)
Tiguvon EC (2 lb. fenthion/gallon)
Rabon[3] (2 lb./gallon EC)
Rabon (50% WP)
Rabon (4 lb./gallon WDS)[4]
Ravap (2 lb. Rabon, 0.2 lb. dichlorvos/gallon EC)
Phosvel[5]—(VCS-506) (3 lb./gallon EC)

Weekly observations were made in each barn. The total number of flies which congregated in four stanchion areas per barn was used as the population index. It is readily recognized that at low temperatures the fly counts were deceptively low because the flies congregated on other surfaces. Retreatments were made when fly populations started to increase rapidly in those particular barns. Flies in some barns were still being killed by the previous treatment, but not at a rate sufficient to maintain control of the population.

RESULTS

Dimethoate

House fly resistance to dimethoate is common in some eastern states and has been increasing each year (2). Table 1 indicates that during the past 5 years there has been no decrease in the duration of fly control resulting from early season dimethoate sprays. The shortest period of control in 5 years of observations was 6 weeks. In previously reported experiments in 1963-64 (1), dimethoate provided 8.3 (range 4 to 10)

[3]2-chloro-1-(2,4,5-trichlorophenyl) vinyl dimethyl phosphate.
[4]Water dispersible solution.
[5]0-(2,5-dichloro-4-bromophenyl) 0-methyl phenlythiophosphonate.

TABLE 1.—Fly Control with Dimethoate Sprays, Applied as Emulsions Unless Otherwise Indicated.

Month Treated	Year	Barns Treated	Concentration (Percent)	Weeks of Control Minimum	Weeks of Control Average
June	1967	6	0.75	7	10.6
	1968	5	0.75	6	9.2
	1969	6	0.75	8	9.8
	1970	4	0.75	8	10.5
	1970*	4	0.75	10	14.3
	1971	7	1.0	7	8.6
August	1967	7	0.5	4	6.0†
	1968	7	0.5	3	7.0†
	1969	8	0.5	3	7.0†
	1970	2	0.75	5	6.5
	1971	2	0.5	8	8.0†

*Wettable powder.

†Most treatments were effective until the end of the fly season.

weeks of control. Certainly dimethoate resistance was not extensive enough in 1970 to cause a general reduction in effectiveness of the early season sprays. In most barns where a good sanitation program was practiced, 10 weeks of control were achieved.

The wettable powder formulation appeared to give slightly longer fly control in 1970 than the emulsifiable formulation of dimethoate. However, further testing is needed to corroborate these results.

Most of the 0.5% sprays applied in August controlled flies for the 6 to 8 weeks until the end of the season (approximately October 1). Therefore, the average duration of control might well have been longer if weather conditions had been conducive to continued fly activity. The fly population which was controlled for only 3 weeks in 1969 was identified in 1970 as having some resistance to dimethoate (3).

Because dimethoate is widely used, is highly effective, and has been extensively tested, it is a standard by which other insecticides can be compared.

Rabon

Early season fly control with 0.75% and 1% Rabon formulations usually lasted 8 to 12 weeks (Table 2). However, in one instance control lasted only 1 week. There seemed to be little difference between 0.75% and 1% dosages or among formulations. There was not enough replication of some treatments to form definite conclusions.

On two occasions when subjected to heavy population pressure, late season Rabon treatments lasted 1 week or less. Resistance of flies

TABLE 2.—Fly Control with Rabon Formulations.

Month Treated	Formulation	Year	Barns Treated	Concentration (Percent)	Weeks of Control
June	EC	1968	2	1.0	11.0
		1969	1	0.75	8.0
			2	1.0	9.5
	WP	1968	2	1.0	11.5
		1970	5	0.75	7.6
			1	2.0	7.0
	WDS	1970	2	0.75	10.0
		1971	4	1.0	8.0
July	EC	1969	1	1.0	12.0
	WP	1970	1	1.0	9.0
	WDS	1970	1	0.75	9.0
August	EC	1967	4	0.75	4.0
		1968	2	0 5	5.0
	WDS	1970	3	0.75	3.7
		1970	1	0.5	4.0
		1971	7	0.5	3.0
September	EC	1969	1	0.5	1.0
	WDS	1970	3	0.5	3.0

to Rabon in one of these barns has been identified by laboratory tests. Fly control with Rabon can be expected to be more variable than that obtained with dimethoate, although control is generally good in the absence of resistance.

The dichlorvos included in Ravap formulations was not expected to have affected residual control of flies, and therefore Ravap was not considered separately.

Diazinon

The period of fly control with 0.75% diazinon tended to be 1 or 2 weeks shorter than that obtained with dimethoate (Table 3). About

TABLE 3.—Fly Control with 0.75% Diazinon EC Applied Two Times During the Summer. Two Barns per Treatment Date.

Month Treated	Year	Weeks of Control
June	1968	8.0
	1969	9.0
	1970	7.5
	1971	1.6*
August	1969	3.5
	1970	1.5
	1971	4.0†

*One barn sprayed with 1% diazinon.

†Three barns sprayed with 0.5% diazinon.

8 weeks of control resulted from treatments applied in June. Control with 0.75% diazinon in 1970 was of shorter duration than in 1968 and 1969, and was equal to 0.5% sprays in 1964. In a barn where diazinon was effective for only 1.6 weeks in 1971, a subsequent spray with Baygon lasted 4 weeks. There was a trend toward shorter intervals of control resulting from diazinon treatments. This is indicative of the development of resistance.

Fenthion

Fenthion provided fly control similar to that obtained with dimethoate (Table 4). Results were consistently good under all conditions and, in the absence of resistance, 6 to 10 weeks of control can be expected.

Iodofenphos

This compound has provided excellent fly control in all situations tested (Table 5). Treatments in June provided 9 to 14 weeks of control. This is about 1 week longer than observed with dimethoate. There was no apparent difference in effectiveness between the wettable powder and emulsifiable formulations.

Other Unregistered Compounds

Phosvel was not as effective as the presently recommended insecticides (Table 6) and is not considered to be competitive. Therefore, it is no longer being tested for fly control in these studies.

Bromophos was similar to Phosvel in effectiveness, and is no longer being considered for fly control.

Baygon was comparable to dimethoate in effectiveness in 1971 tests. It should be tested further.

TABLE 4.—Fly Control with 0.75% Fenthion Emulsion Sprays Applied to Barns

Month Treated	Year	Barns Treated	Weeks of Control
June	1967	5	8.8
	1968	3	10.7
	1969	2	8.0
	1970	2	10.0
	1971	3	6.0*
July	1968	1	7.0
	1970	1	8.0
August	1970	3	4.3
	1971	3	3.0†

*1% spray.
†0.5% spray.

TABLE 5.—Fly Control with Iodofenphos Sprays, Applied as Emulsions Unless Otherwise Indicated.

Month Treated	Year	Barns Treated	Concentration (Percent)	Weeks of Control
June	1968	3	1.0	10.3
	1969	4	0.75	12.8
	1969*	3	0.75	11.7
	1970	3	0.75	14.3
	1971	3	1.0	9.0
August	1970	1	0.75	5.0

*Wettable powder.

TABLE 6.—Fly Control with Other Unregistered Compounds.

Insecticide	Month Treated	Year	Barns Treated	Concentration (Percent)	Weeks of Control
VCS-506 EC	June	1968	2	0.75	8.5
		1969	3	0.75	6.0
	August	1969	1	0.5	1.0
Bromophos EC	June	1968	2	1.0	8.0
	August	1968	1	0.5	4.0*
Baygon WP	June	1971	3	1.0	9.0
	August	1971	5	0.5	6.0

*Effective until the end of the fly season.

CONCLUSIONS

Iodofenphos, diazinon, dimethoate, fenthion, Rabon, and Baygon provided excellent control of flies in Ohio barns during 1967-1971. The data accumulated do not indicate a consistent decrease in the period of effectiveness due to the development of resistance. However, some trends toward decreased effectiveness are developing. Resistance of the house fly to insecticides may soon become a serious problem.

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